Keizer mercury ER
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ENVIRONMENTAL
CLEANUP

DATE: October 21, 2016

SUBJECT: Action Memorandum for the Keizer Mercury Emergency Response Site, Keizer, Marion County, Oregon

FROM: Jeffrey A. Fowlow, On-Scene Coordinator
Spill Prevention and Removal Unit
Emergency Management Program

THRU: Calvin J. Terada, Manager
Emergency Response Unit
Emergency Management Program

TO: Administrative Record
Keizer Mercury Response

I. PURPOSE

The purpose of this Action Memorandum is to document the decision to initiate the emergency response action described herein for the Keizer Mercury Emergency Response Site which is located in Keizer, Marion County, Oregon.

II. SITE INFORMATION

A. Site Description

Site Name:	Keizer Mercury Emergency Response
Superfund Site ID (SSID):	10PW
NRC Case Number:	
CERCLIS Number:	ORN001001877
Site Location:	581 Manbrin Drive NE, Keizer, Oregon 97303
County:	Marion
Lat/Long:	latitude: 44.9874315, longitude: -123.0252341
Potentially Responsible Party (PRP):	See Confidential Enforcement Addendum
Access:	Written consent for access to the property was granted by the property management company representing the property owner on Friday, August 12, 2016. The property is not fenced, gated, nor possessing of signage restricting public access.
NPL Status:	Neither listed nor proposed for listing
Removal Start Date:	Saturday, August 13, 2016

B. Site Background

1. Removal Site Evaluation

At an unknown date prior to July 29, 2016, the resident of Apartment 611 of the Wyatt Lee Apartments, located at 581 Manbrin Drive NE, Keizer, Oregon (Site), was removing property from his unit in preparation for moving. The apartment included one garage space (garage unit 611) of a 4-unit detached garage complex. While moving, the resident accidentally kicked and broke a glass jar that contained approximately 5-8 fluid ounces of elemental mercury. The mercury was used as a component of an automobile carburetor synchronization tool. The resident attempted to clean up the spilled mercury by sweeping the mercury out of the garage onto the asphalt driveway leading to garage unit 611 and adjacent garage units 609, 613, and 615. The act of sweeping the mercury also spread the material under the shared walls and into the adjacent garage unit 613. On August 12, 2016, a different resident of the apartment complex observed a trail of mercury beads leading from garage unit 611 down a short slope toward the middle of the parking lot where a City of Keizer storm sewer drain was located. Salem Fire Department Hazardous Materials personnel notified and requested assistance from the EPA to respond, assess, and cleanup the spilled mercury. The EPA On-Scene Coordinators and Superfund Technical Assistance and Response Team (START) contractors mobilized to site on Friday, August 12, 2016.

The EPA and START initiated assessment on Friday, August 12, 2016. In addition to EPA and START, other parties responding included Salem Fire Department Hazardous Materials, City of Keizer Public Works, and Shelter Management, Incorporated (SMI), the property management company hired by the owner of the apartment complex, Pioneer Trust Bank. Upon arrival at the Site, the presence of mercury was confirmed by visual recognition of the mercury beads on the driveway and by positive detection using a Lumex Model 915 mercury vapor analyzer. Mercury is a hazardous substance as defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §601(14). After the spill had occurred, the resident that caused the spill reported that he swept the mercury out of the garage and onto the asphalt parking area. The parking area is a common area in the apartment complex used frequently by other residents, including families with small children. Given that the spill had occurred several days before any responders were notified, the EPA determined that there was a high risk that the mercury may have been inadvertently spread to other places outside of the spill area. The EPA identified the following areas of concern for potential cross contamination:

- Garage Unit 611, the original spill site.
- Asphalt driveway/parking lot where the mercury had been swept.
- City of Keizer storm sewer drain system.
- Adjacent garage units 609, 613, and 615.
- The vehicles that traverse through the driveway/parking area.
- Nearby apartments, particularly the apartments where the residents would be expected to traverse through the contaminated areas regularly, Units 609, 611, 613, and 615.
- Streets, sidewalks, walkways, and porches where residents may have walked through the contaminated areas and tracked mercury on their shoes.

- Current home and personal property, including a pickup truck, of the former resident of apartment 611.

The Agency for Toxic Substances and Disease Registry (ATSDR) has provided recommended action levels for various environmental settings or exposure scenarios. The action level for normal occupancy in residential settings is 1,000 nanograms per cubic meter of air (ng/m^3). The action level for normal occupancy for commercial settings where mercury exposure is not expected during normal business is 3,000 ng/m^3. For personal property and vehicles, the action level ranges from 3,000 ng/m^3 to 6,000 ng/m^3, depending on expected use of the property, expected duration of exposure, and circumstances such as age, health, and gender of the people involved. The ATSDR recommends that humans are immediately isolated from spilled mercury when a concentration exceeding 10,000 ng/m^3 is determined.[1] For areas such as garages, parking lots, sidewalks, etc., the EPA selected 3,000 ng/m^3 as the action level based on the rationale for the commercial action level: a likely exposure for a reduced period of time of 8 hours in a commercial setting as opposed to a potential exposure time of 24 hours for a residential setting.

The EPA attempted to screen the 15 apartments closest to the spill site. Of the eight apartments where a resident was home and allowed access, the mercury concentrations detected by the Lumex were below the action level 1,000 ng/m3 recommended by the ATSDR. The EPA OSC determined that no further action was required at the apartment residences; however, an EPA Community Involvement Coordinator was mobilized to the Site to meet with residents, answer questions, and provide information regarding mercury.

The EPA also screened the street, sidewalks, walkways, and porches at the apartment complex. The mercury concentrations detected by the Lumex were below the 3,000 ng/m^3 action level selected by the EPA OSC. The EPA OSC determined that no further action was required at any of the street, sidewalks, walkways, and porches.

Based on surveys conducted using the Lumex and/or direct visual observation, the OSC determined that additional removal activities were required at the following locations:

- Garage Unit 611, the original spill site.
- Asphalt driveway/parking lot.
- City of Keizer storm sewer drain system.
- Adjacent garage units 609, 613, and 615.
- Current home and personal property, including a pickup truck, of the former resident of apartment 611.

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[1] ATSDR, Action Levels for Elemental Mercury Spills, March 22, 2012

2. Physical Location

The spill location occurred in a residential, urban area of Keizer, Marion County, Oregon. The property is an apartment complex, with townhouse-style apartments with outside entrances. Apartment units include a single vehicle garage that is detached from the apartments. The garages are attached to one another with four garage units sharing adjacent walls. The interior walls are made of drywall attached to wood stud framing. The garages are secured with a lock on the roll up door. The street and driveways are paved with asphalt and the sidewalks, walkways, and porches are constructed of concrete. There is a small grass lawn in front of each structure. The owner of the property has been identified and information is provided in the Site file.

3. Release or threatened release into the environment of a hazardous substance, pollutant or contaminant

Mercury is a hazardous substances as defined by Section 101(14) of CERCLA, 42 U.S.C. §9601(14).

4. Pictures and other graphic representations

Refer to attached Figure 1 (Location Map) and Figure 2 (Site Map).

III. Threats to Public Health, Welfare or the Environment

A. Nature of Actual or Threatened Release of Hazardous Substances, Pollutants or Contaminants

The predominant threat to human health or welfare is the potential for exposure by inhalation of mercury vapors, although dermal contact with free mercury is also a serious threat to humans. Mercury beads were observed in garage units 611 and 613 and on the asphalt driveway leading to garage unit 611. Mercury beads were also observed in the City of Keizer storm sewer and in the pickup truck owned by the former resident of Apartment 611. Mercury vapor concentrations were detected above background levels at garage units 609, 611, 613, and 615, and were detected on the asphalt surface of the driveway in front of the garage structure. Mercury was detected in the City of Keizer storm sewer catch basin with was located approximately 15 feet in front of garage unit 611 down a slight incline from the garage door. The EPA contacted the former resident of apartment 611 and received consent for access to screen the former resident's current home and property. Although concentrations in the home itself were below recommended 1,000 ng/m^3 ATSDR action levels for residential occupancy, several items of personal property were determined to be heavily contaminated and were likely to become a source of cross contamination in the house. The EPA removed a vacuum cleaner, a waste basket, a washing machine, and material from the owner's pickup truck, and placed them in a container for off-Site disposal. Screening concentrations from these items exceeded the ATSDR action level of 10,000 ng/m^3 recommending isolation from residents or evacuation from the area.

B. Applicable factors (from 40 CFR §300.415) which were considered in determining the appropriateness of a removal action.

1. Actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances or pollutants or contaminants [300.415(b)(2)(i)].

Elemental mercury beads were observed at the Site. Mercury vapors were measured in the driveway/parking area, garage units, storm sewer, and on the former resident's personal property at concentrations exceeding safe exposure levels as determined by ATSDR.

Mercury primarily causes health effects when it is breathed as a vapor where it can be absorbed through the lungs. These exposures can occur when mercury is spilled or when products that contain mercury break and release mercury to the air, particularly in warm or poorly-ventilated indoor spaces. Dermal contact with free mercury is also a serious threat to humans. Mercury is known to cause irreversible damage to the developing nervous system. Most at risk are women who are pregnant or may become pregnant and nursing or young children. Other common health effects in adults include various neurological dysfunctions such as tremors, changes in vision, loss of hearing, muscle coordination, loss of sensation, and difficulties with memory.

2. The availability of other appropriate federal or state response mechanisms to respond to the release [300.415(b)(2)(viii)].

The owner of the apartment complex, Pioneer Trust Bank, hired an environmental cleanup contractor to conduct the removal action at the apartment complex. Pioneer Trust Bank refused to direct its contractor to conduct any cleanup actions at the former resident's house. However, extremely high concentrations of mercury detected in the former resident's truck, washing machine, waste basket, and vacuum cleaner presented a human health risk and a risk to cross contamination of other parts of the house. The OSC tasked START to conduct minor containment of these items. Salem Fire Department requested assistance from the EPA to conduct an emergency response and cleanup. There were no known, other appropriate federal or state response mechanisms capable of providing the appropriate resources in a prompt manner needed to address the potential human health threats described herein.

IV. Selected Removal Action and Estimated Cost

A. Situation and Removal Activities to Date

1. Current Situation

Operations began on Friday, August 12, 2016. On Saturday, August 13, 2016, NRC Environmental Services, Inc. (NRCES) arrived on site to begin mercury recovery on behalf of the property owner. Two EPA OSCs and three START contractors were on Site providing oversight of removal activities, assessment of additional potentially contaminated property, and air monitoring with the Lumex to verify cleanup goals had been achieved. Figure 1 displays the exclusion zone, where the spill occurred, in relation to the apartment complex. The EPA remained on Site until mercury cleanup activities had been completed, including at the home of the former tenant, on August 22, 2016. The property owner's contractor completed site restoration (re-paving the driveway) and transportation and disposal of all wastes on September 16, 2016. The EPA's final task of the removal action was arrangement for the delivery and installation of a replacement washing machine to the current residence of the former tenant. Below were areas of contamination where removal action was required:

- Garage Unit 611, the original spill site.

- Asphalt driveway/parking lot.
- City of Keizer storm sewer drain system.
- Adjacent garage units 609, 613, and 615.
- Current home and personal property, including a pickup truck, of the former resident of apartment 611.

Garage Unit 611 – Garage Unit 611 was the original location of the mercury spill. Upon initial inspection, mercury beads were visible on the surface and in the cracks in the concrete floor of the garage and under the oriented-strand board (OSB) separating the garage unit 611 from the adjacent garage units 609 and 613. Mercury concentrations detected by the Lumex were as high as 19,600 ng/m^3 in garage unit 611. NRCES used a mercury vacuum to remove as much of the liquid mercury as possible. The OSB was removed from the walls separating the adjacent garage units (609 and 613) to allow NRCES to access the mercury beads which had migrated under the OSB. The garage floor was further treated using MERCSORB® Mercury Amalgamation Powder, HgCS-102 Mercury Cleaning Solution, and finely powdered sulfur. These products were used to chemically bind the liquid mercury into chemical compounds that do not readily emit mercury vapors under normal conditions. After removal of visible beads, treatment of the floor with commercial products, and ventilation of the garage with ambient air, on August 18, 2016, Lumex readings inside garage unit 611 were below the 3,000 ng/m^3 commercial re-occupancy concentration recommended by ATSDR and no further removal actions were conducted.

Asphalt driveway/parking lot – The area to the south of garage units 609, 611, 613, and 615 and north of garage units 603, 605, and 607 is paved with asphalt. The surface of the asphalt slopes down to a storm water drain in the center of the driveway/parking lot approximately 15 feet from the garage openings. Upon arrival, the EPA observed many large and small beads of mercury in a three-foot wide trail leading from the door of garage unit 611 fifteen feet down slope to the vicinity of the storm sewer drain. The mercury had migrated from garage unit 611 to the driveway/parking lot when the former tenant of apartment 611 spilled the mercury onto the floor of garage unit 611 and then attempted to remove the mercury by sweeping it outside. On August 15, 2016, despite cleaning efforts, mercury continued to be detected in the driveway in front of garage unit 611 at up to 88,000 ng/m^3 which led to the decision to remove this area of asphalt using a pavement saw. Additional treatments of commercial products and suction were applied after the section of pavement was removed. On August 18, 2016 during one of the hottest afternoons, mercury was detected again up to approximately 70,000 ng/m^3 on the driveway, and additional hotspots of beads were discovered. Thermal treatment applied to these hotspot areas from a gas torch resulted in visible coalescence of macroscopic mercury beads from microscopic mercury beads in the asphalt. Additional bead removal attempts were made, but on August 19, 2016, additional sections of pavement around the hotspots were removed. The excavated areas were treated with sulfur powder and were left to react over the weekend. On Monday, August 22, 2016, mercury concentrations detected by the Lumex around the excavation site were less than the ATSDR commercial re-occupancy concentration of 3,000 ng/m^3 and therefore no further removal activities were necessary in the driveway/parking lot.

City of Keizer storm water drain – A storm water drain maintained by the City of Keizer was located in the middle of the driveway/parking area; see Figure 2 for locations of storm drains in relation to spill site. A trail of mercury beads led from garage unit 611, across the asphalt driveway/parking lot, down

slope to the vicinity of the storm water drain. Although mercury beads were not visible in the storm drain, START collected a sample of the sediment from the storm drain and screened the sample with the Lumex. The mercury vapor concentration from the sediment was as high as 47,000 ng/m^3 in the drain nearest garage unit 611. START performed similar sampling and analysis of the sediment from the next storm drain downgradient (approximately 45 feet downgradient) and mercury vapor concentrations from that sample were 120 ng/m^3, indicating that the mercury had not migrated laterally through the storm drain system. NRCES hand-shoveled, scraped, brushed, and vacuumed all sediment from the affected storm drain catch basin, heated the storm drain catch basin with a torch, and then used a ventilation fan to thoroughly volatilize any residual mercury and dry out the storm drain system. On August 14, 2016, mercury vapor concentrations in the storm drain detected by the Lumex were less than the ATSDR commercial re-occupancy concentration of 3,000 ng/m^3 and therefore no further removal activities were necessary in the storm drain system.

Adjacent garage units 609, 613, and 615 –

Garage unit 609: See Figure 2 for the location of the spill site in reference to the contaminated garages. Mercury beads were not observed in garage unit 609; however, mercury vapor was detected on the floor, on bicycles, and in the breathing zone up to 6,100 ng/m^3. The mercury vapor detections on the tires on several bicycles and scooters appears to have been the result of cross contamination from mercury beads on the asphalt driveway. Concentrations detected from the bicycle tires ranged from 1,000 ng/m^3 to 4,000 ng/m^3. The bicycles were placed out in the sun to promote passive mercury volatilization on August 13, 2016. On Thursday, August 18, 2016, screening with the Lumex indicated the concentrations in garage unit 609 were less than the ATSDR commercial re-occupancy concentration of 3,000 ng/m^3 and therefore no further removal activities were necessary in garage unit 609.

Garage unit 613: Mercury beads were observed in garage unit 613 near and under the wall shared with garage unit 611, and mercury vapors were detected inside the garage at up to 4,800 ng/m^3. It appears that when the former tenant of apartment 611 was sweeping mercury out of garage unit 611, some of the beads migrated into garage unit 613. NRCES used the mercury vacuum to remove visible beads on the floor and treated the area with the commercial products. The bottom section of OSB sheathing was removed from both sides of the 611/613 common wall in order to gain better access to mercury beads. Powdered sulfur was brushed under the wall to bind with the remaining mercury and removed with the mercury vacuum. On Thursday, August 18, 2016, screening with the Lumex indicated the concentrations in garage unit 613 were less than the ATSDR commercial re-occupancy concentration of 3,000 ng/m^3 and therefore no further removal activities were necessary in garage unit 613.

Garage unit 615: Garage unit 615 was used only to store an automobile. The automobile was not found to be contaminated with mercury above action levels, but mercury vapor was detected inside the garage at up 21,800 ng/m^3. The garage floor was treated with the commercial products, and subsequent monitoring on Monday, August 15 indicated the concentrations in this garage had fallen to less than the ATSDR commercial re-occupancy concentration of 3,000 ng/m^3 and therefore no further removal activities were necessary.

Current home and personal property of former tenant of Apartment 611 – On Sunday, August 14, 2016, START used the Lumex to screen the current home, including the hard floors, carpet, clothing, shoes, bedding, furniture, and toys, of the former tenant of Apartment 611. Three items in the home were identified as having elevated concentrations of mercury: a vacuum cleaner (36,000 ng/m^3), the washing machine (15,000 ng/m^3), and a waste basket in the garage (15,000 ng/m^3). The OSC determined

that these objects could not be cost-effectively decontaminated and, therefore, all three items were removed and held for disposal. On August 24, 2016, a replacement washing machine of similar value was provided to the family, consistent with the EPA's Guidance on Compensation for Property Loss. Based on the mercury contamination of the objects found inside the current residence and on conversation with the former tenant, the OSC was concerned that the former tenant's attempt to clean up the spilled mercury in garage unit 611 may have resulted in cross contamination of the former tenant's truck while transporting these objects to his current residence. On August 17, 2016, the EPA and START returned to the residence and surveyed the former tenant's truck. Ambient air inside the vehicle was as high as 80,000 ng/m^3, and liquid mercury beads were observed in the back passenger floor carpet. Mats were removed and a mercury vacuum was used by START to remove visible mercury beads. The truck interior was then screened again with the Lumex and concentrations were still high at up to 83,000 ng/m^3 in the back passenger floor area. Under the OSC's direction and supervision, the contaminated rear curb-side carpet, rear curbside seat cushion, and other contaminated components and articles were removed from the truck for disposal. Hard surfaces were treated multiple times with sulfur powder and suction. START continued the treatments until most residual mercury vapor detections were less than 6,000 ng/m^3 with the exception of one small under-seat storage compartment that could only be cleaned up to less than the ATSDR commercial re-occupancy concentration of 10,000 ng/m^3. The OSC concluded that no further action was necessary with the truck.

Community Trash Bins – Up to 22,000 ng/m^3 of mercury vapor was detected inside one of the community trash bins located behind the garages (see Figure 2 for location). All bags of trash were removed and screened individually with up to 43,000 ng/m^3 mercury vapor detected in one of the bags. Bags with mercury vapor detection of 6,000 ng/m^3 or higher were disposed as hazardous, while the remainder were placed back into the municipal waste stream. The interior of the trash bin was treated with sulfur powder. Lumex readings after decontamination efforts indicated a reading of 2,230 ng/m^3. The OSC concluded that no further action was necessary.

2. Removal Activities to Date

There are no other removal activities currently being performed by other government or private parties that have not been previously discussed.

3. Enforcement

See attached confidential enforcement addendum.

B. Removal Actions

1. Action Description

Wherever observed, visible mercury was removed, if possible, using a mercury vacuum. Thereafter, the affected areas were treated using commercial products, heat from a propane torch or solar heating, and ventilation with ambient and/or forced air. In several cases, multiple techniques and serial applications were required to achieve the desired cleanup goal. Sections of the asphalt parking lot and heavily contaminated property owned by the former tenant of apartment 611 required physical removal of the contaminated media.

Disposal of Mercury Contaminated Materials

On September 16, 2016, all mercury-contaminated materials were properly handled, packaged, and transported to an approved facility. The contaminated materials were disposed of at a facility in compliance with the Off-Site Rule set forth in the National Oil and Hazardous Substances Contingency Plan ("NCP") at 40 C.F.R. § 300.440.

Mercury, mercury-contaminated debris, and mercury comingled with soil or debris, was disposed as hazardous waste D009 to US Ecology in Grand View, Idaho. Disposal of the former tenant's washing machine and other property was arranged by the Oregon Department of Environmental Quality through their contracted waste broker, Waste Watch, Inc.

Best Management Practices

Temporary Best Management Practices were implemented during cleanup activities to protect workers and the public from short-term construction impacts such as fugitive dust and other similar potential impacts.

2. Contribution to Remedial Performance.

This removal action is expected to be the final removal action for the Site. However, if future actions are required, the emergency removal described herein will not impede those actions based upon available information.

3. ARARs

The NCP requires that removal actions attain Applicable or Relevant and Appropriate requirements (ARARs) under federal or state environmental or facility siting laws, to the extent practicable (40 CFR § 300.415(j)). In determining whether compliance with ARARs is practicable, the EPA may consider the scope of the removal action and the urgency of the situation. The following are requirements that may be ARARs for this removal.

Federal ARARs:

Resource Conservation and Recovery Act (RCRA) [42 U.S.C. § 6901], Subtitle"C" - Hazardous Waste Management [40 C.F.R. Parts 260 to 279]. Federal hazardous waste regulations specify hazardous waste identification, management, and disposal requirements. For the management of RCRA hazardous wastes that are not Bevill-exempt, applicability of Subtitle C provisions depend on whether the waste are managed within an Area of Contamination (AOC). 55 FR 8760 (March 8, 1990). Applicable or relevant and appropriate requirements of RCRA Subtitle C (or the state equivalent) may be satisfied by off-site disposal, consistent with the Off-Site Rule, 40 C.F.R. §300.440. RCRA Subtitle C also provides treatment standards for debris contaminated with hazardous waste ("hazardous debris"), 40 C.F.R. § 268.45, although the lead agency may determine that such debris is no longer hazardous, consistent with 40 C.F.R. § 261.3(f)(2), or equivalent state regulations.

Mercury Export Ban Act (MEBA) of 2008. The Mercury Export Ban Act of 2008 (MEBA) amends the Toxic Substances Control Act (TSCA) to prohibit the export of elemental mercury from the United States effective 1 January 2013. MEBA also prohibits the sale, distribution, or transfer of elemental mercury under the control or jurisdiction of federal agencies to any other federal, state, or local government agency or to any private individual or entity, except for the transfer of elemental mercury to facilitate storage under MEBA.

State ARARs:

Oregon Environmental Cleanup Rules (OAR 340-122) are potentially applicable for the establishment of cleanup levels and the selection of response actions for soil at the Site. OAR 340-122-0040(2) requires that hazardous substance response actions achieve one of four standards: 1) acceptable risk levels, 2) generic soil numeric cleanup levels, 3) remedy-specific cleanup levels provided by ODEQ as part of an approved generic remedy, or 4) background levels in areas where hazardous substances naturally occur. The Oregon Hazardous Substance Remedial Action Rules require consideration of treatment of hot spots to the extent feasible (OAR 340-122-0040).

Oregon Hazardous Waste Regulations and federal RCRA (40 CFR Parts 260 to 268; OAR 340-100 to 340-106). Federal regulation promulgated under RCRA, and corresponding state law, provide standards for the identification, management, and disposal of solid and hazardous waste. The regulations pertaining to determining whether a waste is hazardous are potentially applicable, and if any waste is determined to be hazardous, then requirements relating to disposal will be ARARs.

Oregon Solid Waste Management Rules (OAR 340-093 through -097) are potentially applicable to any treatment and disposal of solid waste that may be generated at the Site during conduct of the response action.

Oregon General Emission Standards for Particulate Matter (OAR 340-208-0100 through -210) are potentially applicable to visible emissions and nuisance conditions that may be generated by conduct of the cleanup action.

To-be-Considered Materials:

To-be-Considered Materials (TBCs) are non-promulgated advisories or guidance issued by Federal or State governments that are not legally binding, and do not have the status of potential ARARs. However, in many instances TBCs may be considered along with ARARs in determining the level of cleanup for protection of health or the environment.

EPA/ATSDR Guidance Document for Mercury Vapor Action Levels

Per EPA/ATSDR guidance, ambient conditions in residences should not exceed 1,000 ng/m^3 of mercury near the surface of the floor or in child or adult breathing zones. At or below this level, normal occupancy for even the most sensitive persons is acceptable, assuming normal conditions of use. ATSDR recommends headspace readings for belongings that may have been contaminated by vapors from a mercury spill that are in the range of 3,000 to 6,000 ng/m^3 of mercury be considered protective of human health. Measurements should be taken at the vents of appliances or headspace of bags containing the belongings being evaluated. Bags should be warmed passively to ambient conditions and

appliances/electronics should be at operating temperatures. EPA/ATSDR criteria for use of family vehicles under normal conditions is 3,000 to 6,000 ng/m^3 of mercury. Exposure duration in most vehicles is short compared with other settings, allowing a higher concentration as the floor of this range. The ceiling of the range is based on the presumption that liquid mercury may still be present but not yet discovered.

4. Project Schedule

The EPA and its response contractors mobilized to the Site on August 12, 2016, and completed all removal actions on August 24, 2016.

C. Estimated Costs*

Contractor costs (ERRS/START staff, travel, equipment)	$54,100
Other Extramural Costs (Strike Team, other Fed Agencies)	$0
Contingency costs (10% of subtotal)	$5,400
Total Removal Project Ceiling	$59,500

* EPA direct and indirect costs, although cost recoverable, do not count toward the Removal Ceiling for this removal action. Liable parties may be held financially responsible for costs incurred by the EPA as set forth in Section 107 of CERCLA.

VI Expected Change in the Situation Should Action be Delayed or Not Taken

A delay in action or no action at this Site would have increased the actual or potential threats to the public health and/or the environment.

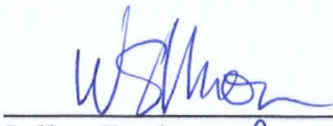
VII Outstanding Policy Issues

None.

VIII Approvals

This decision document represents the selected removal action for this Site, developed in accordance with CERCLA, and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the administrative record for the Site.

Conditions at the Site meet the NCP Section 300.415(b) criteria for a removal action, and through this document I approved the removal action described herein. The total project ceiling is $59,500. Of this, as much as $59,500 comes from the Regional removal allowance.



10-20-16

Jeffrey Fowlow for
Federal On-Scene Coordinator

Date

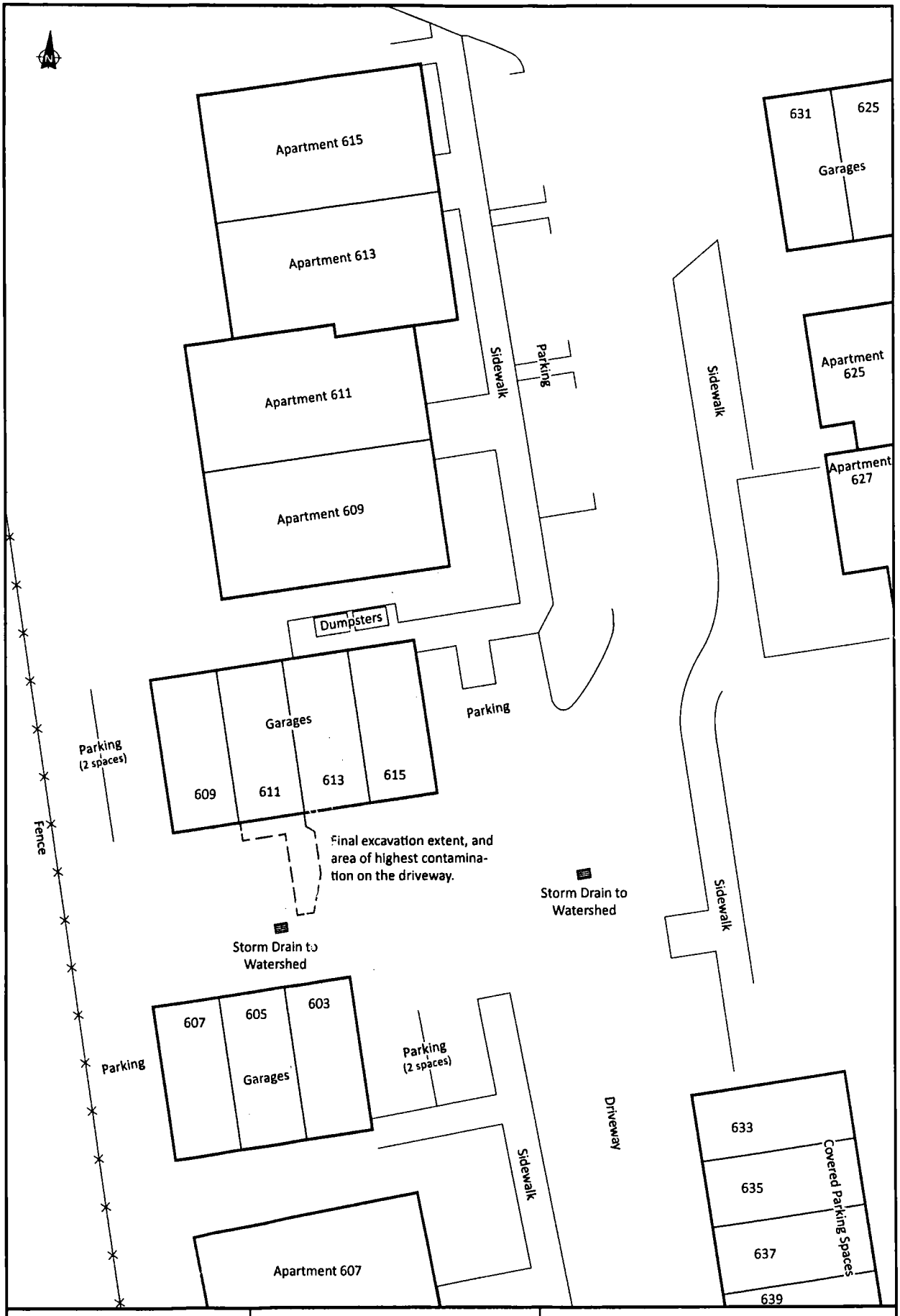
ecology and environment, inc.
Global Environmental Specialists
Seattle, Washington

KEIZER MERCURY SPILL ACTION MEMORANDUM
Keizer, Oregon

Figure 1
Location Map

0 50 100
Approximate Scale in Feet

Date:	Drawn by:	
8/22/16	AES	10:START-IV\16080003\fig 1



ecology and environment, inc. Global Environmental Specialists Seattle, Washington	KEIZER MERCURY SPILL ACTION MEMORANDUM Keizer, Oregon	Figure 2 SITE MAP	
	0 10 20 Approximate Scale in Feet	Date: 8/22/16	Drawn by: AES
			10:START-IV\16080003\fig 2

Attorney-Client Communication/Enforcement Confidential/Do Not Release Under FOIA

Confidential Enforcement Addendum for the Keizer Mercury Emergency Response Site

(b) (6)

[redacted]